Problem D: Secret Crates

The Ark of the Covenant is finally recovered by Indiana, and is handed to people from the U.S. government. Being such a powerful and mysterious artifact, the powers that be decide to take the Ark to Hangar 51, a special facility which is the resting place to many secret items. These items are placed inside numbered crates before being stored under top secret circumstances.

Figure 1: The crate that holds the Ark of the Covenant

The officers in charge of Hangar 51, being very fond of prime numbers, have established a special design for storing items in the warehouse. The place is divided in many areas, each area identified by a primer number P_A. Then, a number **N** of crates are stored in area P_A, and for each crate i a prime number P_i is chosen, such that $P_A < P_1 < P_2 < P_3 < \ldots < P_N$, where (P_i, P_{i+1}) are consecutive prime numbers, for every i in $[1, N)$. Each crate is then marked with the composite number $P_A \times P_i$.

Figure 2: Hangar 51

For example, let's say that P_A for a certain area is 11, P_1 for the same area is 17, and that it stores 3 crates. Then their numbers will be 11×17, 11×19 and 11×23. Hence, they are labeled: 187, 209, 253.

You are given the numbers of the first and last crate from a certain area. Your task is finding the number P_A that identifies their area, and the number N of crates that belong to it.

Input

Input starts with a positive integer **T**, that denotes the number of test cases ($T \leq 80$).

Each test case contains two positive integer numbers, I_1 and I_2. $I_1 < I_2 < 10^{12}$.

In addition, you can assume that both I_1 and I_2 are composite numbers such that:

- $I_1 = P_A \times P_1$.
- $I_2 = P_A \times P_N$.
- P_A, P_1, P_N are prime numbers, as described above.
- $P_N - P_1 \leq 10^6$.

Output

For each test case, print the case number, and then print the message "**area P_A has N crates**".

Sample Input

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2
187 253
9906573 9906753
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Output for Sample Input

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Case 1: area 11 has 3 crates
Case 2: area 3 has 7 crates
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